



Docket No. 34647-432USPX
P12409US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Benny FONDEN et al.

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Serial No.: 09/742,857

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Examiner: Not Yet Assigned

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Filed: December 20, 2000

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Group Art Unit: Not Yet Assigned

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Title: METHOD AND DEVICES TO PROVIDE A DEFINED QUALITY OF SERVICE IN A
PACKET SWITCHED COMMUNICATION NETWORK

Box Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

CERTIFICATE OF MAILING

37 C.F.R. §1.8(a)

I hereby certify that this correspondence is being deposited with the U. S. Postal Service as First Class Mail in an envelope addressed to: Box Non-Fee Amendment, Assistant Commissioner for Patents, Washington, D.C. 20231, on the date indicated below.

March 28, 2001

Date

Ella Sisco
Signature

Dear Sir:

PRELIMINARY AMENDMENT

Prior to commencing the examination of the above-referenced application, please amend the application as set forth below to place the application in condition for allowance.

In the Specification

Page 2:

Replace the paragraph beginning at line 9 with the following:

-- In communication systems like GSM (global system for mobile communications) or subscriptions which correspond to different traffic precedences (European Standard ETSI EN 301 344 V 6.4.0; 3rd Generation Partnership Project, Technical Specification 3G TS 23.060 V 3.1.0). Subscription information specifying the resources which are to be allocated for forwarding traffic of the user are stored in a data base in the system. Generally, a record is kept in a data base denoted as the home location register (HLR) serving the user, in many systems with a copy in a visitor

register (VLR) serving the area in which the user is presently located. If a connection is set up for the user, a data base is contacted regarding which resources, for example bandwidth, are to be allocated to the user for the connection to the core network, e.g. on the radio link. It is possible that a negotiation process with the user equipment is performed during the access and the allocated resources differ from the record entry by taking into account the available resources under the present traffic conditions. --

Page 3:

Delete the paragraph beginning at line 24.

Page 7:

Replace the paragraph beginning at line 9 with the following:

-- Some edge nodes do not have the capability to access the data base containing the user record for a transfer of the data necessary for the setting of the DS data field. In these cases, it is preferable that a second node with this capability accesses the data base and forwards the information to the edge node which processes packets for said user. An example is a transfer of data from the user through the core network wherein the data packets are created in an RNC. The parameters for the setting of the DS data field are requested from the data base, e.g. an HLR, by the SGSN which serves the RNC. The parameters are then transferred from the SGSN to the RNC. Another example is a connection through two edge nodes of the network which both require the subscription information to set the DS data field for packets in uplink and downlink direction, respectively, although the setting can differ for both directions. When the connection is set up from the first edge node, e.g. the SGSN serving the user, it is provided with the information from the data base and can forward it to the other edge node, e.g. a GGSN connecting the user to a host in a further network. In this way, the other edge node obtains the subscription information without the necessity to contact the database. A transfer of subscription information between nodes is also preferable if the communication system comprises different nodes for the forwarding and control of traffic. If the nodes processing the traffic, e.g. media gateways, are controlled by one or several other nodes, e.g. MSCs, the information is preferably obtained from the data base by the controlling node and

forwarded to one or several nodes processing the traffic. A transfer of subscription information between nodes can reduce the processing load of a central base significantly. --

Page 8:

Replace the paragraph beginning at line 4 with the following:

-- Preferably, the data packets are Internet protocol (IP) packets, for example of IP version 4 or IP version 6. The IP is preferably the protocol for the routing layer in the GPRS and UMTS core networks, wherein user IP packets are encapsulated consecutively in GTP (GPRS Tunneling Protocol) PDUs (Packet Data Units), UDP (User Datagram Protocol) PDUs and IP PDUs for the routing through the core network. Therefore, the implementation of the invention using the DS field in the header of the IP packets on the routing layer of the core network as DS data field requires only a moderate effort. --

Page 13:

Replace the paragraph beginning at line 20 with the following:

-- The logical position of the edge nodes may deviate from the physical edge of the core network CN. Especially, if the access network AN can provide the same differentiated service as the core network CN, the edge node setting the DS data field can be located inside or at the edge of the access network. For example, it is possible that the edge node is an RNC in the access network serving the user equipment UE or it is located in the user equipment UE itself, e.g. in a terminal adapter. An edge node can also be located in the further communication system FS, if it supplies the same differentiated service as the core network CN. --

In the Claims

1. (Amended) Method for the provision of a defined quality of service in a packet switched communication system with interconnected nodes (N) for forwarding of data packets, wherein the system comprises at least one edge node (EN) for connection to user equipment (UE) or a further communication system (FS) and for processing data packets which comprise a data field specifying

a handling of the packets and the nodes (N) perform differentiated handling of the packets according to said data field wherein the communication system further comprises or is connectable to a data base (DB) which contains a record for a user specifying a quality of service for said user, an edge node (EN) which processes a packet for said user is provided with quality parameters from the data base (DB) and the edge node (EN) sets the data field specifying the handling of the packet according to the record.

2. (Amended) Method according to claim 1, wherein the data field is specified according to a requested quality of service.

3. (Amended) Method according to claim 2, wherein the data packets are processed according to a protocol stack and an edge node (EN) sets the data field according to information specified on a layer (LA, LI) in the protocol stack of the edge node (EN) which is different from the layer (LR) evaluated by the nodes for the handling of the packets.

4. (Amended) Method according to claim 1, wherein the data field is specified according to a traffic load in the communication system.

5. (Amended) Method according to claim 1, wherein quality parameters are forwarded from a second node (EN') to the edge node (EN) which processes data packets for said user.

6. (Amended) Method according to claim 1, wherein the data packets are internet protocol packets and the data fields is the differentiated services field in the internet protocol header.

8. (Amended) Method according to claim 6, wherein the bits (CP) specifying the per hop behavior are set according to the record.

9. (Amended) Method according to claim 1, wherein said data base (DB) is a location register.

10. (Amended) Method according to claim 1, wherein a node (N) evaluates the data field if the traffic load is above a threshold value.

11. (Amended) Edge node in a packet switched communication system with interconnected nodes (N) for a forwarding of data packets, wherein the edge node (EN) processes the data packets and is connectable to a node (N) and to user equipment (UE) or a further communication system (FS) and the packets comprise a data field for specifying a handling of the packets in the nodes (N), wherein the edge node (EN) is provided with an interface to access a data base (DB) holding user records, and the edge node (EN) is also provided with means to store parameters specifying a quality of service for the user served from a record for said user and the edge node (EN) is provided with processing means which set the data field specifying the handling of the packet according to the record.

12. (Amended) Edge node according to claim 11, wherein the node is provided with means to process data packets according to a protocol stack and the processing means set the data field on the layer (LR) evaluated by the nodes (N) for the handling of the packets according to data evaluated from a different layer (LA, LI) in the protocol stack.

13. (Amended) Edge node according to claim 11 wherein an edge node is a serving GPRS support node (SGSN) or a gateway GPRS support node (GGSN).

15. (Amended) Edge node according to claim 11 wherein the edge node is a radio network controller (CR) or an adapter in a user equipment (UE).

16. (Amended) Node for a packet switched communication system with interconnected nodes (N) for a forwarding of data packets which comprise a data field specifying a handling of the packets, wherein the nodes (N) comprise processing means for performing a differentiated handing of the packets according to said data field, the data packets are internet protocol packets and the data field is the differentiated services field in the internet protocol header, wherein the node evaluates the

unspecified bits (UD) in the differentiated services field and performs the packet handling according to the unspecified bits (UD).

17. (Amended) Node according to claim 16, wherein the node (N) is provided with means to measure a traffic load and the data field is evaluated if the traffic load is above a threshold value.

18. (Amended) Program unit on a data carrier or loadable into an edge node in a packet switched communication system, wherein the edge node (EN) provides connections and processes packets sent between user equipment (UE) or a further communication system (FS) and nodes (N) in the communication system which perform a differentiated handling of the packets according to a data field in the data packets, wherein the program unit comprises means for loading parameters for a user served by the edge node, said parameters specifying a quality of service for said user, and the program unit comprises means for setting the data field according to the parameters.

19. (Canceled)

REMARKS

The Specification has been amended to remove references to the claims and to improve the readability of the text.

The claims have been amended to remove multiple dependencies and reference numerals, to correct antecedent basis errors, and to improve the clarity of the claim language.

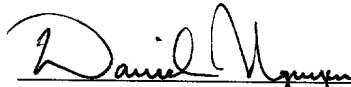
Marked-up changes to the Specification and Claims are attached herewith in Appendices A and B, respectively. No new matter has been added.

Favorable consideration of this application as presently amended is respectfully requested.

No fees are believed to be due for this submission. However, should there be any additional fees required, please charge such additional fees to Deposit Account No. 10-0447, reference 34647-432USPX.

Respectfully submitted,

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APPENDIX A
MARKED-UP CHANGES TO THE SPECIFICATION

Page 2:

Paragraph beginning on line 9 has been amended as follows:

In communication systems like GSM (global system for mobile communications) or subscriptions which correspond to different traffic precedences (European Standard ETSI EN 301 344 V 6.4.0; 3rd Generation Partnership Project, Technical Specification 3G TS 23.060 V 3.1.0). Subscription information specifying the resources which are to be allocated for forwarding traffic of the user are stored in a data base in the system. Generally, a record is kept in a data base denoted as the home location register (HLR) serving the user, in many systems with a copy in a visitor location register (VLR) serving the area in which the user is presently located. If a connection is set up for the user, a data base is contacted regarding which resources, for example bandwidth, are to be allocated to the user for the connection to the core network, e.g. on the radio link. It is possible that a negotiation process with the user equipment is performed during the access and the allocated resources differ from the record entry by taking into account the available resources under the present traffic conditions.

Page 3:

Paragraph beginning on line 24 has been amended as follows:

[According to the invention, the method described in claim 1 is performed. The invention is also embodied in devices and software programs as described in claims 11, 16 and 18. Advantageous embodiments are described in claims 2 to 10, 12 to 15, 17 and 19.]

Page 7:

Paragraph beginning on line 9 has been amended as follows:

Some edge nodes do not have the capability to access the data base containing the user record for a transfer of the data necessary for the setting of the DS data field. In these cases, it is [proposed] preferable that a second node with this capability accesses the data base and forwards the information

to the edge node which processes packets for said user. An example is a transfer of data from the user through the core network wherein the data packets are created in an RNC. The parameters for the setting of the DS data field are requested from the data base, e.g. an HLR, by the SGSN which serves the RNC. The parameters are then transferred from the SGSN to the RNC. Another example is a connection through two edge nodes of the network which both require the subscription information to set the DS data field for packets in uplink and downlink direction, respectively, although the setting can differ for both directions. When the connection is set up from the first edge node, e.g. the SGSN serving the user, it is provided with the information from the data base and can forward it to the other edge node, e.g. a GGSN connecting the user to a host in a further network. In this way, the other edge node obtains the subscription information without the necessity to contact the database. A transfer of subscription information between nodes is also preferable if the communication system comprises different nodes for the forwarding and control of traffic. If the nodes processing the traffic, e.g. media gateways, are controlled by one or several other nodes, e.g. MSCs, the information is preferably obtained from the data base by the controlling node and forwarded to one or several nodes processing the traffic. A transfer of subscription information between nodes can reduce the processing load of a central base significantly.

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Paragraph beginning on line 4 has been amended as follows:

Preferably, the data packets are Internet protocol (IP) packets, for example of IP version 4 or IP version 6. The IP is [proposed as] preferably the protocol for the routing layer in the GPRS and UMTS core networks, wherein user IP packets are encapsulated consecutively in GTP (GPRS Tunneling Protocol) PDUs (Packet Data Units), UDP (User Datagram Protocol) PDUs and IP PDUs for the routing through the core network. Therefore, the implementation of the invention using the DS field in the header of the IP packets on the routing layer of the core network as DS data field requires only a moderate effort.

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Paragraph beginning on line 20 has been amended as follows:

The logical position of the edge nodes may deviate from the physical edge of the core network CN. Especially, if the access network AN can provide the same differentiated service as the core network CN, the edge node setting the DS data field can be located inside or at the edge of the access network. For example, it is possible that the edge node is an RNC in the access network serving the user equipment UE or it is [the] located in the user equipment UE itself, e.g. in a terminal adapter. An edge node can also be located in the further communication system FS, if it supplies the same differentiated service as the core network CN.

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APPENDIX B
MARKED-UP CHANGES TO THE CLAIMS

The claims have been amended as follows:

1. (Amended) Method for the provision of a defined quality of service in a packet switched communication system with interconnected nodes (N) for [the] a forwarding of data packets, wherein the system comprises at least one edge node (EN) for [the] connection to user equipment (UE) or a further communication system (FS) and for processing data packets which comprise a data field [(10)] specifying [the] a handling of the packets and the nodes (N) perform differentiated handling of the packets according to said data field [(10)], characterized in that] wherein the communication system further comprises or is connectable to a data base (DB) which contains a record for a user specifying a quality of service for said user, an edge node (EN) which processes a packet for said user is provided with quality parameters from the data base (DB) and the edge node (EN) sets the data field [(10)] specifying the handling of the packet according to the record.

2. (Amended) Method according to claim 1, wherein the data field [(10)] is specified according to a requested quality of service.

3. (Amended) Method according to claim 2, wherein the data packets are processed according to a protocol stack and an edge node (EN) sets the data field [(10)] according to information specified on a layer (LA, LI) in the protocol stack of the edge node (EN) which is different from the layer (LR) evaluated by the nodes for the handling of the packets.

4. (Amended) Method according to [any preceding] claim 1, wherein the data field [(10)] is specified according to a traffic load in the communication system.

5. (Amended) Method according to [any preceding] claim 1, wherein quality parameters are forwarded from a second node (EN') to the edge node (EN) which processes data packets for said user.

6. (Amended) Method according to [any preceding] claim 1, wherein the data packets are internet protocol packets and the data fields [(10)] is the differentiated services field in the internet protocol header.

8. (Amended) Method according to claim 6 [or 7], wherein the bits (CP) specifying the per hop behavior are set according to the record.

9. (Amended) Method according to [any preceding] claim 1, wherein said data base (DB) is a location register.

10. (Amended) Method according to [any preceding] claim 1, wherein a node (N) evaluates the data field [(10)] if the traffic load is above a threshold value.

11. (Amended) Edge node in a packet switched communication system with interconnected nodes (N) for [the] a forwarding of data packets, wherein the edge node (EN) processes the data packets and is connectable to a node (N) and to user equipment (UE) or a further communication system (FS) and the packets comprise a data field [(10)] for specifying [the] a handling of the packets in the nodes (N), [characterized in that] wherein the edge node (EN) is provided with an interface to access a data base (DB) holding user records, and the edge node (EN) is also provided with means to store parameters specifying a quality of service for the user served from [the] a record for said user and the edge node (EN) is provided with processing means which set the data field [(10)] specifying the handling of the packet according to the record.

12. (Amended) Edge node according to claim 11, wherein the node is provided with means to process data packets according to a protocol stack and the processing means set the data field [(10)] on the layer (LR) evaluated by the nodes (N) for the handling of the packets according to data evaluated from a different layer (LA, LI) in the protocol stack.

13. (Amended) Edge node according to claim 11 [or 12] wherein an edge node is a serving GPRS support node (SGSN) or a gateway GPRS support node (GGSN).

15. (Amended) Edge node according to claim 11 [or 12] wherein [an] the edge node is a radio network controller (CR) or an [a] adapter in a user equipment (UE).

16. (Amended) Node for a packet switched communication system with interconnected nodes (N) for [the] a forwarding of data packets which comprise a data field [(10)] specifying [the] a handling of the packets, wherein the nodes (N) comprise processing means for performing a differentiated handling of the packets according to said data field [(10)], the data packets are internet protocol packets and the data field [(10)] is the differentiated services field in the internet protocol header, [characterized in that] wherein the node evaluates the unspecified bits (UD) in the differentiated services field and performs the packet handling according to the unspecified bits (UD).

17. (Amended) Node according to claim 16, wherein the node (N) is provided with means to measure [the] a traffic load and the data field [(10)] is evaluated if the traffic load is above a threshold value.

18. (Amended) Program unit on a data carrier or loadable into an edge node in a packet switched communication system, wherein the edge node (EN) provides connections and processes packets sent between user equipment (UE) or a further communication system (FS) and nodes (N) in the communication system which perform a differentiated handling of the packets according to a data field [(10)] in the data packets, [characterized in that] wherein the program unit comprises means for loading parameters for a user served by the edge node, said parameters specifying a quality of service for said user, and the program unit comprises means for setting the data field [(10)] according to the parameters.

19. (Canceled) [Program unit according to claim 18, wherein the program unit performs at least one step of a method according to any of the claims 1 to 10.]